

molift[®]

SMART 150150



CE

- a patient lifter from

TM09201 Molift Smart 150 English

molift[®]
designed for life

TECHNICAL MANUAL

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IMPORTANT!

The patient lifter is only meant to be used by qualified personnel.

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General advice

This technical manual contains important safety instructions and information regarding the service and repair of the lifter. Carefully read the manual in order to be familiar with function and use, service and repair of the lifter.

Explanation of symbols

 *This symbol is used to point out instructions and information related to work place safety where injury may occur if the information is disregarded or ignored. Follow these instructions, be careful and attentive at all times.*

 *This symbol indicates important information regarding the use of the equipment. If not taken into consideration, it may lead to damage or functional defects to the lifter or other equipment.*

 *This symbol indicates important and useful information. If taken into consideration, it will help the operator of the lifter to work efficiently. It may help simplify routines and to explain complicated facts.*

Caution

When repairing the lifter, you will find it necessary to lift and handle heavy, long and/or sharp objects. When disassembling and assembling the lifter you may also find that the stability of the lifter may be reduced, increasing the risk of toppling the lifter or parts falling down.

Therefore, use general caution when performing maintenance and repairs.

 *The lifter must not under any circumstances be put to use or tested with load without the bottom cover C²⁷ (Appendix C, position 27) properly in place with all bolts fastened. The plate contributes significantly to the stiffness of the chassis, and lifts without this plate may cause irreparable structural damage to the chassis.*

Responsibility

Please read these operating instructions carefully before putting the product into operation. We assume no liability for damage or malfunctions resulting from failure to comply with the instructions. Warranty claims must be made immediately on detecting the defect. Remember to quote the serial number. Consumable parts are not subject to the warranty.

All technical information, data and instructions for operation contained in these operating instructions were up-to-date at time of print and are compiled on the basis of our experience and to the best of our knowledge. We reserve the right to incorporate technical modifications within the scope of further development of the product described in this manual. No claims can be derived from the information, illustrations or descriptions contained in these instructions. We assume no liability for any damage or malfunction caused by operating errors, non-compliance with these operating instructions or inappropriate maintenance. We expressly point out that only genuine Etac Supply Gjøvik spare parts and accessories approved by us may be used. For safety reasons, the fitting and use of spare parts or accessories, which have not been approved, and unauthorised modification or conversion of the product, are not permitted. Etac Supply Gjøvik will accept no liability for damages resulting from such acts.

With the exclusion of product liability, Etac Supply Gjøvik is liable for faults or omissions on its part within the scope of the warranty obligations stated in the purchase contract. Claims for damages are excluded, irrespective of the legal reason from which such claims are derived. Only documentation belonging to the actual equipment is valid.

Any failure to comply with the safety regulations and precautionary measures stated in these operating instructions renders the declaration of conformity supplied with the system in accordance with Council Directive (93/42/EEC) concerning medical devices invalid.

Technical description

Chassis

The chassis **A②**, is made out of bent steel plates coated with polyester. The chassis consists of spread legs **C⑪**, **C⑫** the spread mechanism with pedals **C⑬**, **C⑭** and locking mechanism for lifting column with lock handle **C⑯**. The rear castors (with brakes) **C⑤** are at the back - the wheels are turnable and not necessary to lubricate.

Legs

The legs are attached to the chassis with a bolt **C⑥** and bushings locked together with a special fastener. A castor **C⑪** is mounted at the tip of each leg (without brake) in a plastic cast moulded bracket.

Leg spreading mechanism

The leg spreading mechanism is found inside the chassis. The mechanism is operated by pumping the pedals **C⑬**, **C⑭**. The movement of the pedal will lift the brake bar **C⑯** and engage the sleeve **C⑭** to the sprocket **C⑨**. This will produce a circular movement of the sprocket and a movement of the legs via leg spreader rods **C⑯** connected to the legs.

Lifting column security lock

The chassis also holds a mechanism that prevents the lifting column to be fixed in the bracket before the legs are spread to working position. This security device consists of a stopper **C⑮** held in place by a spring connected to a bracket **C⑯**. As long as the legs are in transport position, the stopper will hit the bent end of the left leg bar and in this way prevent the lifting column to be lowered completely into the bracket. When the legs are moved to the minimum working position, the bent end of the leg bar will slide away allowing the stopper to be pushed all the way down by the lifting column.

Lifting column

On the lifting column, you will find the battery **A③**, battery holder with electronics **B⑭**, bracket for actuator **B⑯** and the push/pull handle **B④**.

Battery holder

The battery holder **B⑯** is made out of an plastic mould in which the battery will fit. In the battery holder, you will find the spring contacts **D⑯**. The emergency switch **D⑨** is mounted at the side of the battery holder, and the main PCB **D⑤** is placed inside with the LED visible trough a hole in the battery holder. A button on the main PCB providing emergency lowering is possible to access through a hole in the battery holder.

Electronics

The electronics consists of one printed circuit board (PCB) **D⑤** with remote control, emergency stop **D⑨** and lowering switches, and battery and service lights. All functions rely on the main PCB. The control card has a counter, which registers the number of seconds with activity. After a certain time, it signals to activate the service light to inform the user that the lift needs service. An electric emergency lowering switch is located above the stop switch. The motor has a manual emergency lowering function in case of a power failure.

Driving handle

The curved driving handle **B④** is pressed into the two bushings **B⑦** on each side of the lifting column. The bushings have a seat for a rubber O-ring which is glued in place with Loctite. Loctite is also applied inside the bushing before the handle is pressed in place.

Actuator

The lower part of the actuator **B⑯** is connected to the lifting column bracket **B⑯** and the upper part to the lifting arm **B⑯** and bracket **B⑯**.

Lifting arm with suspension

The lifting arm **B⑯** is hinged to the lifting column through a bushing with bolt. The suspension **B⑯** is possible to rotate 360° - the rotation is braked by an O-ring inside the connection.

Charger and battery

The Molift Powerpac system is a custom battery pack built up by a 14,4 V battery pack, a charger frame and the charger with wire.

Service

Molift Smart 150 has a LED on the battery holder indicating if the lifter needs service. The LED gives a green light when the lifter is ready for use.



The electronics logs how much the lifter is being used, and the load it is used with. After a given time of usage there will be given a signal that the lifter needs service to the service LED. The LED will first give a yellow light, then red. Take contact with your local service representative and order service. If there is a sound together with the light, it means the lifter needs service immediately.

Service lamp	Status
No light	Power save
Green	Ready for use
Yellow	Order service, lifter still works
Red	Perform service
Red + sound	Perform service immediately

Service consists of replacing the lifting motor and check/replacement of worn or damaged parts. Service and repair should be performed by authorized personnel only.

Fill in and sign a copy of the checklist on next page. The owner is responsible to ensure proper logging and written verification of each service or repair. Service

Equipment and special tools

Equipment

The accessories and equipment related to the daily use of the lifter - see User manual.

Special tools

Universal wrench

The majority of the external fasteners on the lifter has a special grip which requires a special wrench. This can be bought in any well equipped hardware store, and we recommend models with adjustable span.



Illustration only

Fault finding

See User manual.

If the fault finding table in the user manual is inconclusive, you will have to try by method of elimination and judgement.

Repairing

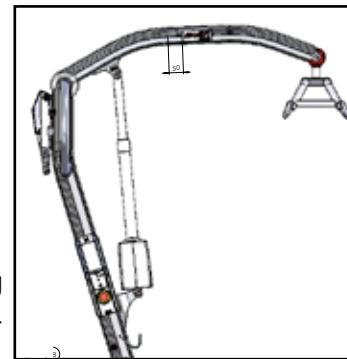
Actuator

You will need:

- Loctite 243
- Special wrench x 2
- Hot air gun

Procedure:

- Raise the lifting column to an upright position and - if possible - raise the lifting arm to horizontal position.
- Loosen the battery support and disconnect the cable on the backside of the battery support. Remove the wire anchorage.



- Open special screw **B14** at the lower actuator bracket **B16** using the special wrench.



It may be necessary to heat the bolt/fastener to disable the Loctite used when assembled. Limit the heating to a minimum area and apply as little heat as possible to avoid unintentional spreading of heat to other parts.

 *The actuator will come loose and may fall down when performing the next steps. It is recommended to have assistance holding the actuator, or try to secure it in other ways (i.e. tie it with a rope) to control the action.*

- Open special screw **B14** at the upper actuator bracket **B22** using the special wrench.
- Push out both bolts **B15**, if necessary; tap carefully using a bolt with the same diameter.
- Lift the actuator out and put it carefully down.
- Get the new actuator and place it in position - make sure it is placed correctly with the motor

housing on the same side as the battery holder.

- Push the bolts in place.
- Add Loctite 243 on the threads of the special screws and tighten them.
- Connect the cable for the actuator to the cable from battery support. Place the cable in the slot on the back of the support and screw the battery support back on the column.
- Fasten the wire anchorage.
- Perform safety inspection, see page 13.

Rear castors

You will need:

- Loctite 243
- Special wrench x 2
- Hot air gun
- Spanner 13 mm

Procedure:

- Open special nut (13).

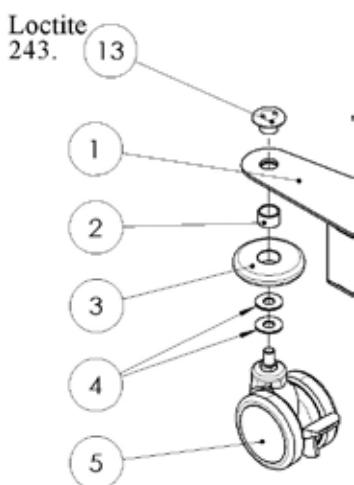


It may be necessary to heat the bolt/nut to disable the Loctite used when assembled.



Limit the heating to a minimum area and apply as little heat as possible to avoid unintentional spreading of heat to other parts. If possible - use a narrow nozzle.

- Pull the castor (5) with bolt out of the bracket.
- Prepare the new castor by putting washers (4), bushing (2) and wall wheel (3) over the bolt.



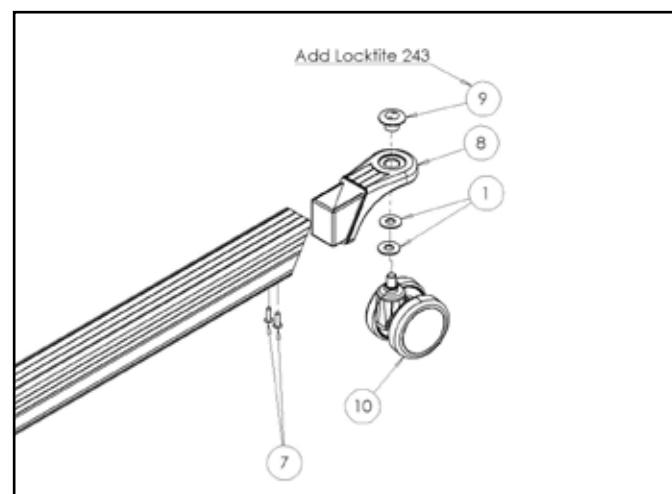
- Place the assembly into the bracket and apply Loctite 243 to the threads of the special nut (13) before tightening.

Front castors

The castors on the front legs are mounted in brackets made of plastic cast moulded brackets. If it is the castor C1® itself that has been damaged, it is possible to pull it off and replace it with a new one.

Front castor with bracket

Since heating of the assembly to disable the Loctite will damage the bracket, it is necessary to replace the bracket (8) if the castor pin or special nut (9) is damaged.



You will need:

- Pop rivet 4,8x16 mm tool
- Drill steel Ø 5mm

Procedure:

- Carefully drill out the pop rivets (7) at the underside of the leg to release the bracket (8)



Be careful when drilling out the pop rivet. Do not drill into the aluminium of the leg.

- Pull the bracket out of the leg profile.
- Insert the new bracket and verify that the rivet holes in the bracket and profile corresponds.
- Fasten the bracket with the pop rivets.
- Check that the new castor works properly.

See safety inspection on page 13.

Electronics (PCB)

You will need:

- Torx 20 screwdriver
- Allen key 5 mm
- Screwdriver flat

Procedure:

- Copy settings from old PCB in lifter to the new main PCB by using Molift Servicetool. See the user manual for the Servicetool for instructions.
- Remove the connector for the hand control from bottom of the battery support.
- Remove the screws **B36** fixing the battery support to the column, one on top and one in bottom.



- Disconnect the cables on the backside of the battery support.



- Remove the two screws **D10** on each side of the battery support, and remove the label.



- Pull the three parts of the battery support carefully apart.

• Lift the emergency lowering extenders from the emergency switch on the main PCB. Use a flat screwdriver and push them carefully apart.



- Push/pull the main PCB out of the battery support. Take care of the extenders.



- Emergency stop button may be detached by releasing the locking ring inside the battery holder.
- Disconnect the cable connector for motor and battery.



- Connect the motor and battery connector to the new main PCB.
- Place the top piece of extender in the lower hole in the battery support, and the two lower pieces on the emergency lowering switch on the PCB.
- Pull the main PCB **D5** in place in the slot in the battery support.



- Push the extenders on the emergency lowering switch, and the complete battery supports together. Make sure the PCB enters the slots.
- Assemble the holder and screws **D10**.

- Carefully remove and scrape away any remains of the old sticker before placing the new one.
- Connect the cables on backside of battery support to cables on lifter and place them in slot.
- Attach the battery support to the column with the two screws **B36**, use Loctite 243 on screws. Make sure the cables do not get squeezed.
- Reconnect cable for hand control.
- Perform safety inspection (page 13).

Leg mechanism / pedals

The leg spreading mechanism is fairly complicated and requires experience and in depth knowledge to repair. We recommend that a lifter with malfunctioning leg spreading mechanism should be sent back to the manufacturer for repair and adjustment. However, if you believe that the fault is easy to correct, i.e. to re attach a spring - open the bottom cover **C27** and try to correct the fault. If the problem is caused by a broken part deeper in the mechanism, please contact the manufacturer for advice.



Always check the leg spreading mechanism after any repair.

- Legs does only move inner position when column is lifted up (transport position)
- With column mounted the legs does not move inside working position (parallel position)



Illustration shows lifter in working position.

Transport elastic

You will need:

- New elastic
- Knife or scissors

Procedure:

- Remove the lifting column/-arm from the chassis.
- Remove the old elastic **B9** by cutting it close to the reel **B8**. Remove the reel and the old elastic, and be careful to get out any loose parts inside the column.
- Thread the new elastic trough the reel and position this in the middle.
- Thread the ends of the elastic through the eyes at the top of the column.
- Push the elastic into the column and make sure that the ends are travelling downwards in the column. It may help to raise the column upright.
- When the ends emerge at the base of the column - verify that the ends of the elastic pass on each side of the lower bolt in the column. If not, this has to be corrected.
- Tighten the elastic approx. 20 cm and tie a thorough knot.
- Release the knot and verify that the elastic and reel at the top has a tension of approx. 2 kg. If not, pull the elastic out from the base and tie another knot further in to pretension the elastic some more.
- Cut of any excess length of elastic, but leave approx. 5 cm below the knot.

Suspension / O-ring in suspension

You will need:

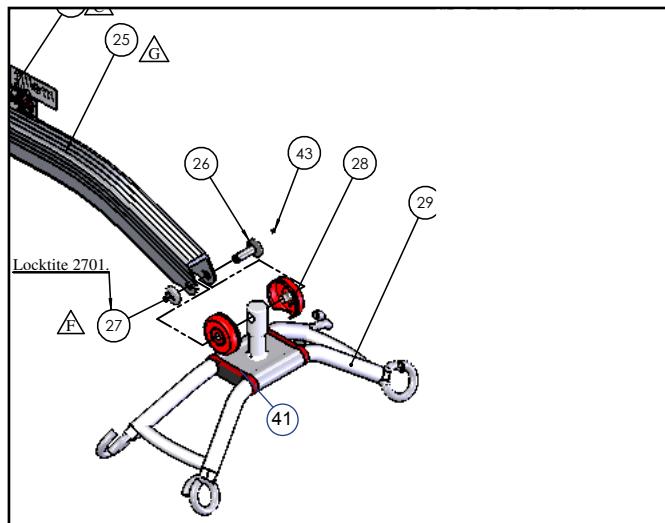
- Loctite 2701
- Special tool
- Punch 5 mm

Procedure:

- Remove the padding on the suspension (41)
- Loosen the two special bolts (27) with the special tools and punch out the bolt (26).
- Remove the suspension assembly and remove the plastic covers (28). Use the punch carefully on the inside to separate the covers.

! Verify that bolts or suspension are not worn or damaged in any way. Damage to these parts may cause a fracture in the assembly causing serious personnel injury.

- Replace worn or damaged parts and assemble the suspension as reverse order, see fig below.



- Apply Loctite 2701 on the threads of the special bolt (27) and tighten.
- Re-fit the padding.
- Perform safety inspection, see page 13.

Lifting arm, lifting column and legs

If any of these parts are structurally damaged, the entire lifter must be shipped to the manufacturer for evaluation, control and repair. Damage to the main structures of the lifter indicates that the lifter has been in a situation where abnormal forces has been applied. Such a situation can potentially influence the future safety of the lifter, and shall not be attempted repaired by other than the manufacturer.

Foam cover chassis/legs

You will need:

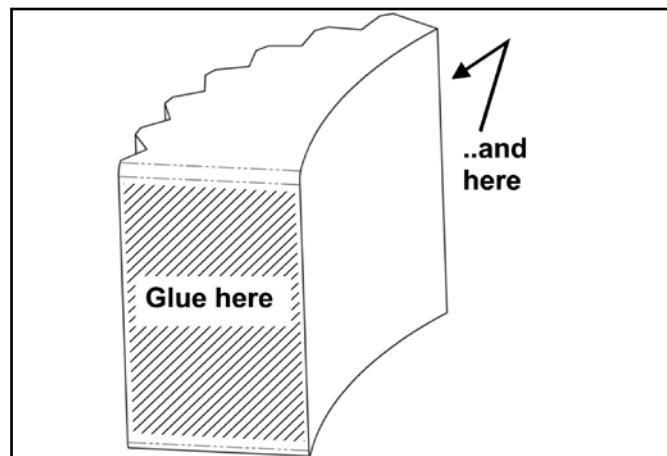
- New foam cover
- Solvent for removal of glue remnants
- Express glue

Procedure:

- Spread legs to maximum width.
- Remove the remain of the old foam cover C⑩ using a plastic scrape

 Be careful when scraping in order to prevent damage to the chassis coating.

- Wash off any remains of foam and glue using the cleaning solvent
- Dry surfaces well and verify that the surface is smooth and clean
- Apply glue at the end of the new foam part as indicated below.



- Press the new foam cover in place aligning the curve of the cover with the chassis.
- Allow the glue to settle for a while and then glue the narrow part of the foam cover to the leg profile.
- Do not use the lifter until the glue has dried - ref. specification of the glue.

Lifting column stopper

You will need:

- Special pop rivets 4x8,5 mm and tool
- Drill steel Ø 5mm
- New parts

Procedure:

- Remove the lifting column from the chassis.
- Carefully drill out the pop rivets **C46** at the back of the chassis

 *Be careful when drilling out the pop rivet. Do not drill into the chassis.*

- Remove bracket **C47** and stopper **C48**.
- Replace damaged parts.
- Push the assembly into the lifting column bracket and verify that the holes in the bracket correspond with the holes in the chassis.
- Fasten the bracket with the pop rivets.

 *Always check the leg spreading mechanism after any repair.*

- Legs does only move inner position when column is lifted up (transport position)
- With column mounted the legs does not move inside parallel position (in working position)



Illustration shows lifter in working position.

Plugs in column lock

You will need:

- Drill steel 3mm and 6,1 mm
- New nylon plugs **C172**

Procedure:

- Drill a 3 mm pilot hole in the remaining nylon.

 *Be careful when drilling out the nylon. Do not damage the lock itself.*

- Carefully drill out the remaining nylon with the 6,1 mm drill steel and clean the hole.
- Press / gently tap the new nylon plug in place.
- The new plug may be too long and may have to be trimmed using a sharp knife to fit.

Finishing the job

Safety control

Any repair or replacement of parts requires a safety control afterwards. The procedure of control is described in the checklist on next page. The owner of the lifter is responsible for keeping a copy of the checklist, filled in and signed by authorized service representative.

Please make copies of this and next page!

Logging

Use the table below for logging of repair and work done on the lifter. Write down a short description of the incident in the appropriate interval. This will enable the owner and service partner to see previous history for the lifter and in that way maybe making future fault finding and repairs easier. It is also possible to save information about service and repair when using the service tool.

Serial number of lifter: _____

Inspection Diagram after Service and Repair

MOLIFT Smart 150

Service:

- Checked service lamp if service is necessary: YES (yellow or red light) / NO (green light)
Use Molift Servicetool and read the lifters data - check number of lifts left before service: _____
- Service is completed : - Replaced lifting motor/actuator. Worn or damaged parts, or malfunctioning parts, are replaced. See description for parts replacement.
- Service light was reset using Molift Servicetool. N.B.: The service light must ONLY be reset after completed service!
- Perform safety inspection after service.

Safety Inspection

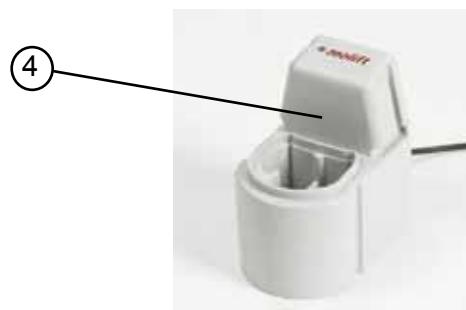
- The lift has been visually checked for damages, malfunction and deformation, and it is in order. Checked that lifting column is properly fastened to chassis, and that the lifter has no loose parts.
- Checked that mounting of column works correct. With legs in outer position (working position), it is possible to run the column up and down easily, and the column falls in place in the base. With lifter in transport position it is not possible to leave the column in upright position (it falls down when pushing slightly)
- Checked that remote control works and that wire and socket for remote control are undamaged.
- Checked that the lifter functions correctly and runs without load all the way up and down without abnormal noise.
Checked that end stop works. Repeated test with a load of approx. 100 kg.
- The suspension and lifting arm are checked visually for damage, play and deformations. The suspension shall be turned 360° with some friction. If no defects or malfunctions are discovered, the suspension shall be tested with maximum load (150 kg). Run the lift up and down 2 - 3 times and turn the suspension 360° around 2 - 3 times with maximum load. Perform a new visual control; damage, play and deformations as described above. Any damaged parts must be repaired or replaced and the test is performed once more until the lift performs correctly.
- Checked that the leg spreading mechanism functions properly. Tested with maximum load. Verified that the legs do not move beyond inner and outer limits (working position) when operated with load. The legs does not move inside parallel positions (or working position) with column mounted.
- Checked that emergency stop and lowering (electric and manual) are working correctly.
- Service light is green and batteries are sufficiently charged.
- Marked lift with safety sticker with month/year and certificate number for completed safety inspection. Inspecting person must sign safety sticker and this diagram.

Inspection, repair and service should be done by a person certified by, or on behalf of Etac Supply Gjøvik. Always complete below:

Client: _____ Serial number of lifter: _____

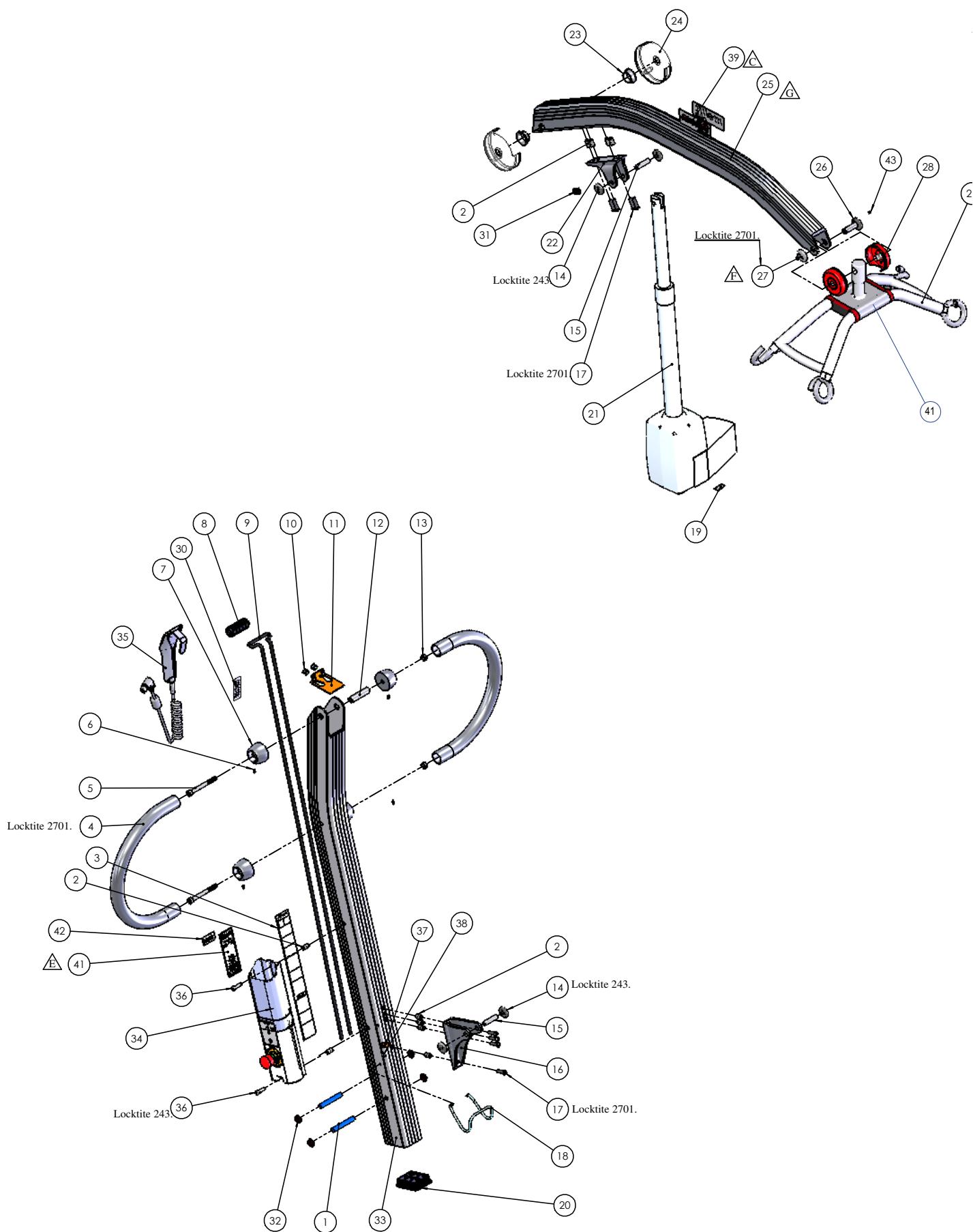
Date: _____ Signature: _____

Appendix A

Main components

Appendix B

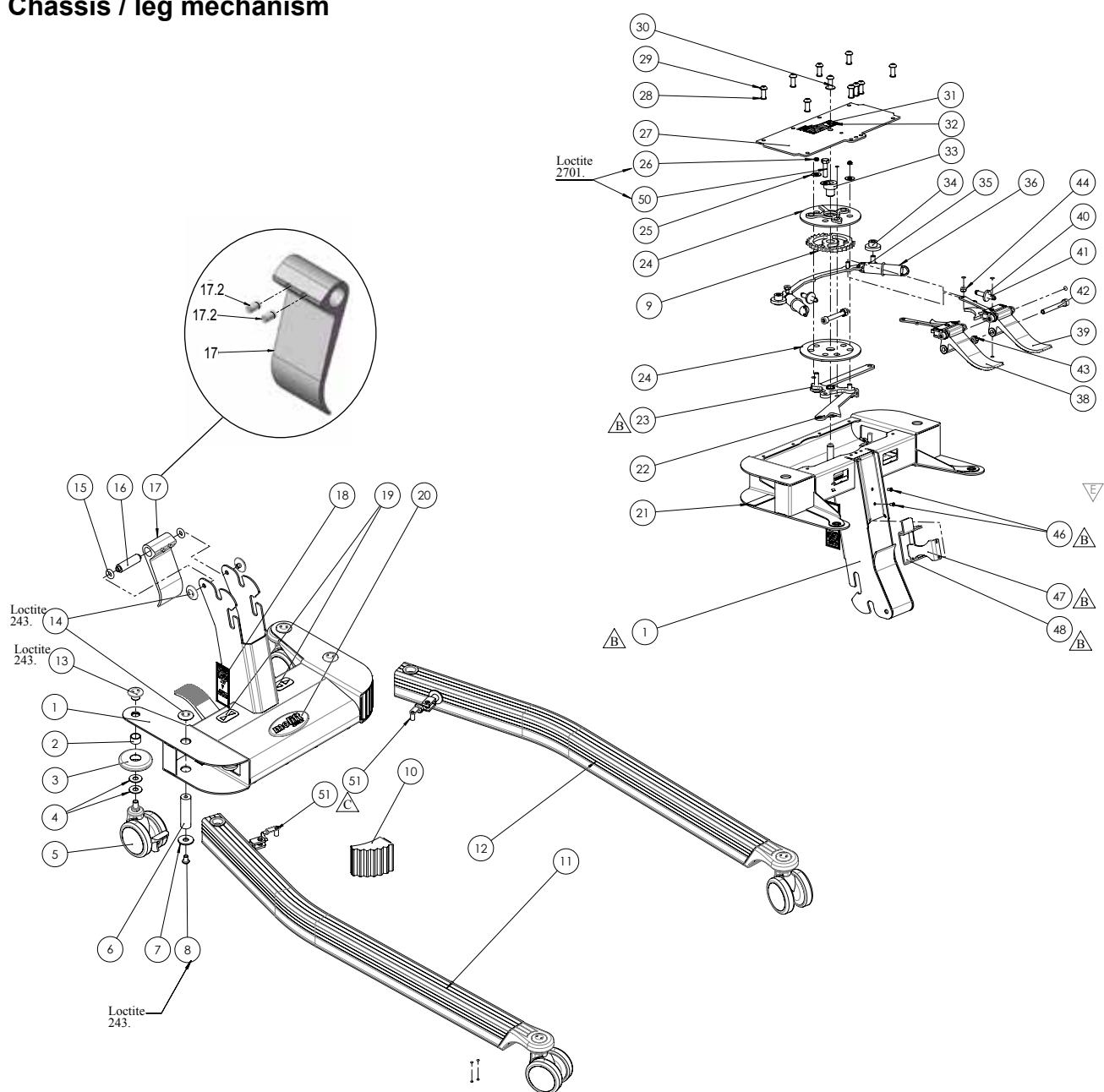
Column and lifting arm



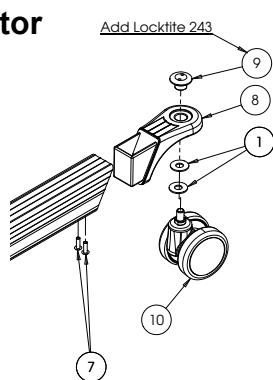
Appendix C

Pos.	No	Art. no..	Description
1	1	0920009	Chassis machined / painted
2	2	0910155	Wallwheel sleeve
3	2	0910154	Wallwheel
4	4	1120312	Fender washer HB140 Ø10
5	2	0920108	Wheel 75mm w/brake
6	2	0910151	Bolt for leg
7	2	1120320	Washer HB140 Ø10,5xØ30x2,5
8	2	1120506	Screw, button head M8x10 ISO7380
9	1		Sprocket, see pos 52
10	2	0920071	Foam cover for chassis
11	1	0920510	Right leg complete - see below
12	1	0920511	Left leg complete - see below
13	2	0910153	Nut, special M10
14	4	0910152	Nut, special M8
15	2	0910190	O-ring DIN3770 Ø10x5
16	1	0910157	Bolt for column lock
17	1	0920513	Column lock set Smart, incl pos 14,15,16
17.1	1	0920518	Eccentric lock mounted, incl pos 17.2
17.2	2	0920213	Plastic pin Ø6,2, column lock
18	1	0220310	Label, security check
19	1	0920303	Decal: leg spreading
20	1	0920301	Label, Molift Smart 3D
21	2	0920517	Plate, Polyethylene mounted
22	1		Needle bearing, see pos 52
23	1		Leg spreader rods Smart 150, see pos 52
24	2		Support disc, see pos 52
25	3		Washer, plane Ø8,4x18x1,25, see pos 52
26	2		Nut, hex thin M8 ISO4035, see pos 52
27	1	0910201	Bottom cover
28	9	0920208	Washer Nordlock Ø6,5/10,8x1,8
29	10	0220119	Screw, buttonhead M6x10 ISO7380
30	1	0220121	Washer Ø6,4 ISO703/DIN9021
31	1	1310307	Label, controlled date/sign
32	1	0220309	Label, Authorized personnell only
33	1		Sleeve for cogwheel, see pos 52
34	2		Guide sleeve, see pos 52
35	1		Brakebar, Molift Smart, see pos 52
36	2	0920222	Spring, Extension with O-ring, see pos 52
37			
38	1	0920508	Pedal assy right, Smart, Set
39	1	0920509	Pedal assy left, Smart, Set
40	2	0220118	Washer neoprene Ø22x5,5x3,5
41	3	0920223	Extension spring SF-DF 1x8x18
42	2	0920209	Screw DIN912 M8x65 Elzn
43	2	1150414	Nut, lock DIN985 M8 Elzn
44	2	0228125	Nut, lock DIN985 M6 Elzn
45	1	0920306	Label Molift Smart 150

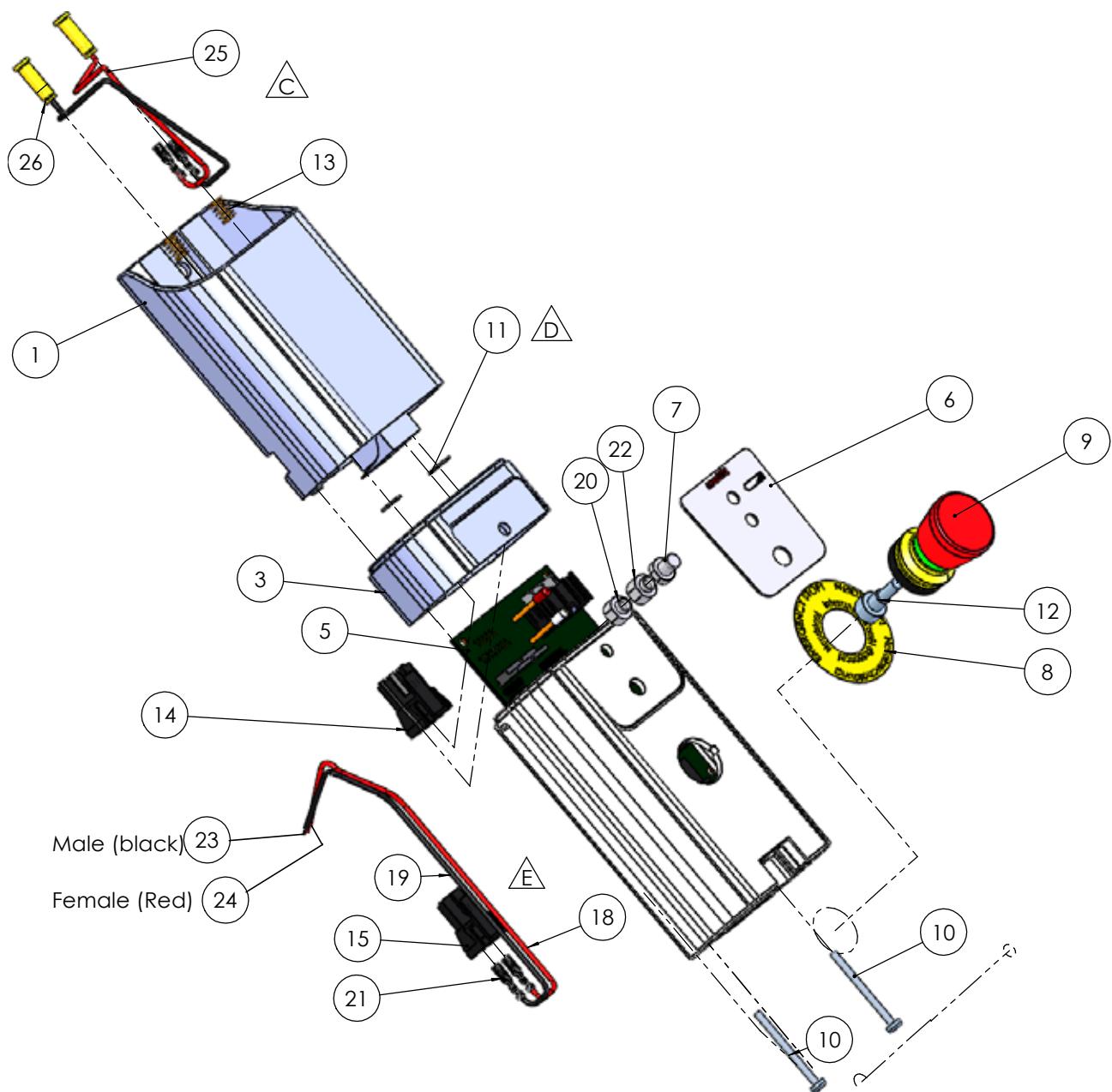
Chassis / leg mechanism



C1 Bracket with front castor

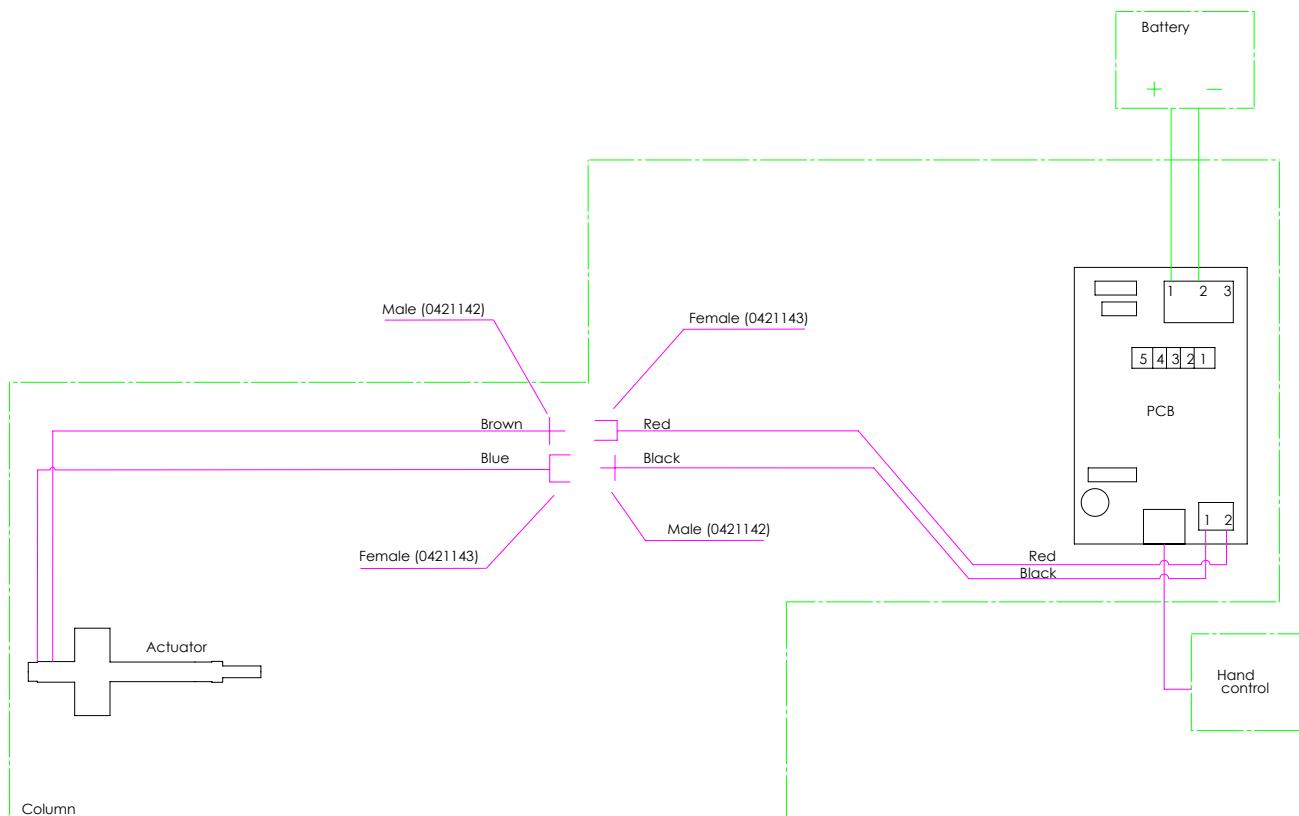


Appendix D

Battery holder / electronics

Appendix E

Electrical Diagram



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www.patienthandling.com.au

Ceiling Hoist Solutions

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58-62 Star Crescent
AU-3803 Hallam, VIC
www.ceilinghoistsolutions.com.au

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